Conclusions of HRI/ITS Standards Kickoff Meeting, January 20, 2000

Standards Crossing Major Interfaces

Interface: Wayside Equipment Terminator – Roadway Subsystem

- **Interface between Wayside Equipment (Rail signal control device) and the Advanced Traffic Controller (Roadway signal control device).**

Notes:

a. The HRI gates, lights, etc. which provide warnings to roadway vehicles are *currently* under the control the of railroad-operated Wayside Equipment. However, the vision of the National ITS Architecture is that all signals which warn and direct roadway vehicles would be under the control of one Roadway Subsystem and its intelligent Advanced Traffic Controller. This remains the subject of some contention whose resolution needs to be reflected and guided by standards in this area.

b. In the rail community, the interface between Wayside Equipment and the Roadway Subsystem's Advanced Traffic Controller is defined to include all aspects of the interaction between these controllers, both logical and physical, therefore potentially all layers of the OSI stack and therefore one or more entire *families* of standards, not a single standard. An important initial SDO task is to disaggregate and identify the specific individual standards of interest.

Responsibility: Under discussion.

a. The IEEE Rail Transit Vehicle Interface Committee has set up a group to handle communications between the Wayside Equipment and the Advanced Traffic Controller.

   IEEE includes in this activity: updated standards and practices for train detection and signal activation, incorporating information like train length, speed, and direction, presence of second train, etc.

   IEEE is supported in this effort by AREMA, APTA, AAR and the shortline and regional railroads.

b. NTCIP's ATC Group has a process under way to develop standards for coordinating HRI warning signals with nearby traffic signals. This appears to be self-contained in

the Roadway Subsystem, and does not include the link between Wayside Equipment and the ATC. However, there was some strong feeling that such a link should be compatible with NTCIP and take NTCIP conventions and structures into account.

It is not clear whether this activity includes standardizing the *decision algorithm* for activating nearby traffic signals, or whether it is focused mainly on the structures for delivering the messages for activating signals *given* a decision to do so.

- **Low cost HRI warning devices at low volume crossings (i.e., private crossings and HRIs which are currently passive)**

  Responsibility:

  Defer; not ready to be standardized. However, aggressive action is needed in thinking about ITS approaches and technology to address this issue, which the National Transportation Safety Board has identified as a primary concern.

Interface: Rail Operations Center – Traffic Management Center

- **Expand NTCIP center-to-center protocols to include the link between the Rail Operations Center and the Traffic Management Center.**

  Responsibility:

  Lead: NTCIP
  Support: IEEE, AREMA, AAR to take part in development and balloting

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Interface: Traffic Management Subsystem – Roadway Subsystem

- **NTCIP center-to-field-equipment links between Traffic Management Center and (Intelligent) Advanced Traffic Controller**
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  Responsibility:

  Lead: NTCIP

Interface: Roadway Subsystem – Vehicle Subsystem

- **Expand DSRC message set to include mobile/portable HRI warnings**

  Responsibility:

  Lead: IEEE

- **Standardize in-vehicle HRI warnings, including conditions for issuing warnings, false alarm issues, messages, icons, ear-cons, coordination with other (external) warnings such as dynamic message signs.**

  Responsibility:
  Lead: SAE
  Support: ITE, AASHTO

Standards Within Major Subsystems or Terminators

Within Rail Operations Terminator

- **Human Factors at Rail Operations Center**

  Responsibility: Defer

Within Traffic Management Subsystem

- **Expand the Traffic Management Data Dictionary to incorporate HRI elements and messages**

  Responsibility:
  Lead: ITE and AASHTO
  Support: AAR, AREMA

- **Human Factors at Traffic Management Center**

  Responsibility: Defer

Within Roadway Subsystem

- **Expand Advanced Traveler Information Systems Data Dictionary and Message Set to incorporate HRI elements and messages**

  Responsibility:
  Lead: SAE
  Support: AAR, AREMA, AASHTO

- **NTCIP center-to-field-equipment link between Advanced Traffic Controller and DSRC base station, for in-vehicle warnings.**

Responsibility:
Lead: NTCIP/ATC Group
Support: SAE

- **Revise MUTCD to accommodate needs of high-speed rail HRIs, high profile HRIs, and general HRIs**

  Responsibility:
  FHWA (in progress)

- **Revise MUTCD to include physical design of Dynamic Message Signs (DMS) for the HRI**

  Responsibility:
  FHWA, FRA

- **Revise MUTCD to include message content standards for Dynamic Message Signs (DMS) for the HRI.**

Some controversy over whether this is a suitable topic for national standardization

  Responsibility:
  FHWA, FRA

- **Revise AASHTO Green Book to include design specifications for high profile crossings** [Note that this is not specifically an ITS standard]

  Responsibility:
  Lead: FRA, FHWA, AASHTO
  Support: AAR, AREMA

- **Standards for (Intelligent) Advanced Traffic Controller**

  Responsibility:
  NTCIP's ATC group

- **Minimum equipment standards for gates and barriers**

  Responsibility:
  Part of MUTCD, therefore FHWA/FRA
  Also part of AREMA recommended practices

- **Practices for HRI Roadway Surveillance**
  Signal/gate violation detection
  Traffic/congestion management
  Incident detection and notification

  Responsibility:
  Defer; to be explored by ITE, SAE, and U.S. DOT Working Technical Group

- **Standards for HRI Obstacle Detection**

  Responsibility:
  Defer; no ownership at present

- **Human Factors at the HRI**

  Responsibility:
  Defer; no ownership at present. This is a newly identified area for standardizing, relating to the effect of signs, gates, lights, etc. on the driver or pedestrian approaching or entering the HRI.

Within Vehicle Subsystem

- **Vehicle undercarriages to accommodate high profile crossings** [Note that this is not specifically an ITS standard]

  Responsibility:
  SAE

OTHER

- **Glossary of HRI terms**

  Responsibility:
  No current ownership. Possible candidates: FRA, ITE, ITS America

- **Recommended practices for closing crossings** [Note that this is not specifically an ITS standard]

  Responsibility:

  Legislation of national policy; input from AAR, U.S. DOT Technical Working Group